WHAT IS CLAIMED IS:

1. A self-expanding stent comprising a lattice, wherein the lattice comprises two different types of helices forming a hollow tube having no free ends, the first type of helix is formed from a plurality of undulations, the second type of helix is formed from a plurality of connection elements in series with the undulations, wherein the connection elements connect fewer than all of the undulations in adjacent turns of the first type of helix and the first and second types of helices proceed circumferentially in opposite directions along the longitudinal axis of the hollow tube.

2. The self-expanding stent of claim 1, wherein each undulation is formed from ascending and descending arms connected together at a junction point.

3. The self-expanding stent of claim 2, wherein the connection element extends between the junction points lying on adjacent undulations.

4. The self-expanding stent of claim 3, wherein the number of connection elements in each 360 degree turn of the first type of helix is at least two.

5. The self-expanding stent of claim 4, wherein the number of connection elements in each 360 degree turn of the first type of helix is four.

6. The self-expanding stent of claim 1, wherein the undulations form a zigzag pattern.

7. The self-expanding stent of claim 1, wherein the undulations form a sinusoidal pattern.

8. The self-expanding stent of claim 1, wherein the first type of helix terminates in a transition zone formed by a plurality of undulations which have a closed loop at one end of the transition zone and connect to the undulations forming the first type of helix at the other end of the transition zone and wherein the amplitude of the undulations forming the transition zone increases as the undulations proceed circumferentially from the end forming the closed loop to the end connected to the first type of helix.

9. The self-expanding stent of claim 8, wherein the two ends of the transition zone are separated by at least one 360 degree turn of the first type of helix.

10. The self-expanding stent of claim 8, wherein the transition zone is linked by a plurality of connection elements to a closed circumferential element and the closed circumferential element is formed from a plurality of undulations.

11. The self-expanding stent of claim 8, wherein the undulations of the transition zone and the closed circumferential element have a sinusoidal pattern.

12. The self-expanding stent of claim 8, wherein the undulations of the transition zone and the closed circumferential element have a zigzag pattern.

13. The self-expanding stent of claim 10, wherein the closed circumferential element is radiopaque.

14. The self-expanding stent of claim 1, wherein the stent is composed of a nickel-titanium alloy.

15. A self-expanding stent comprising a lattice wherein the lattice comprises two different types of helices forming a hollow tube having no free ends, the first type of helix is formed from a plurality of zigzags and the second type of helix is formed from a plurality of connecting elements in series with the zigzags wherein the connection elements connect fewer than all of the zigzags in adjacent turns of the first type of helix and the first and second types of helices proceed circumferentially in opposite directions along the hollow tube.

16. The self-expanding stent of claim 15, wherein each zigzag is formed from ascending and descending arms connected together at a junction point.

17. The self-expanding stent of claim 16, wherein the connection element extends between the junction points lying on adjacent zigzags.

18. The self-expanding stent of claim 17, wherein the number of connection elements in each 360 degree turn of the first type of helix is at least two.

19. The self-expanding stent of claim 18, wherein the number of connection elements in each 360 degree turn of the first type of helix is four.

20. The self-expanding stent of claim 15, wherein the first type of helix terminates in a transition zone formed by a plurality of zigzags which have a closed loop at one end of the transition zone and connect to the zigzags forming the first type of helix at the other end of the transition zone and wherein the amplitude of the zigzags forming the transition zone increases as the zigzags proceed circumferentially from the end forming the closed loop to the end connected to the first type of helix.

21. The self-expanding stent of claim 20, wherein the two ends of the transition zone are separated by at least one 360 degree turn of the first type of helix.

22. The self-expanding stent of claim 20, wherein the transition zone is linked by a plurality of connection elements to a closed circumferential element, wherein the closed circumferential element is formed from a plurality of zigzags.

23. The self-expanding stent of claim 22, wherein the closed circumferential element is radiopaque.

24. The self-expanding stent of claim 15, wherein the stent is composed of a nickel-titanium alloy.

25. A self-expanding stent comprising at least one continuous first type of helix having no free ends, wherein the first type of helix comprises a plurality of zigzags, a second type of helix comprising a plurality of connection elements in series with the zigzags, wherein the connection elements connect fewer than all of the zigzags in adjacent turns of the first type of helix and the first and second types of helices proceed circumferentially in opposite directions to form a lattice in a tubular shape.

26. The self-expanding stent of claim 25, wherein each zigzag is formed from ascending and descending arms connected together at a junction point.

27. The self-expanding stent of claim 26, wherein the connection elements connect two peaks lying on adjacent zigzags.

28. The self-expanding stent of claim 25, wherein the first type of helix terminates in a transition zone formed by a plurality of zigzags which have a closed loop at one end of the transition zone and connect to the zigzags forming the first type of helix at the other end of the

transition zone and wherein the amplitude of the zigzags forming the transition zone increases as the zigzags proceed circumferentially from the end forming the closed loop to the end connected to the first type of helix.

29. The self-expanding stent of claim 28, wherein the two ends of the transition zone are separated by at least one 360 degree turn of the first type of helix.

30. The self-expanding stent of claim 28, wherein the transition zone is linked by a plurality of connection elements to a closed circumferential element, wherein the closed circumferential element is formed from a plurality of zigzags.

31. The self-expanding stent of claim 30, wherein the closed circumferential element is radiopaque.

32. The self-expanding stent of claim 25, wherein the stent is composed of a nickel-titanium alloy.

33. A self-expanding stent comprising a lattice, wherein the lattice comprises two different types of helices forming a hollow tube having no free ends, the first type of helix being formed from a plurality of zigzags, the second type of helix being formed from a plurality of connection elements in series with the zigzags, wherein there are four connection elements in each 360 degree turn of the first type of helix and the first and second types of helices proceed circumferentially in opposite directions along the longitudinal axis of the hollow tube.